

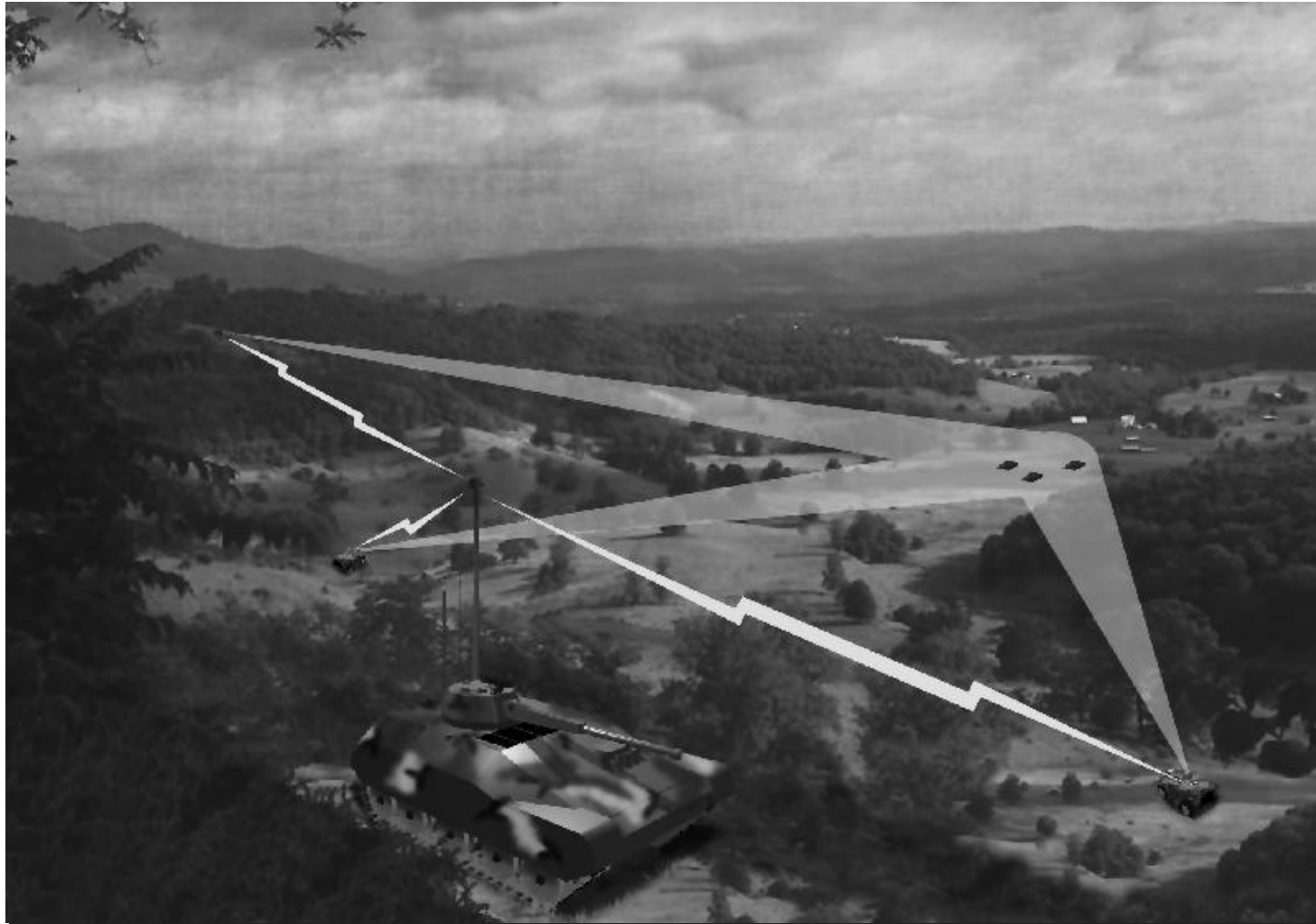


GENERAL DYNAMICS

Robotic Systems

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Demo III Operational Concept



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Performance Goals

- **Overall System**
 - Intelligent, Modular, Open Software Architecture
 - Operable by Troops
 - Total Robotic Vehicle Weight: 2500 lbs
 - Transportable in Theater (e.g., Helo, V-22)
 - Ruggedization Suitable for User Appraisal
- **Mobility**
 - Day/Night/Limited Adverse Weather (Rain/Dust) Operation
 - Road Following: 40mph in Lane (High Reliability)
 - Cross Country: Speed Appropriate to Terrain & Vehicle Dynamics, Up to 20mph (day, dry), 10mph (night, wet)
 - Detect and Avoid All Non-Negotiable Obstacles
 - Towable by HMMWV
 - Mission Duration: 24 hrs



- **Planning**
 - Four Vehicle Mission
 - Operator Pre-Mission Planning & Intermittent Supervision Thereafter
 - Single Seat HMMWV Installable OCU / Non-Dedicated Vehicle
 - Planning For:
 - Feature Extraction/Trafficability Assessment
 - Tactical Behaviors
 - Target Hand-Off Among Multiple Vehicles
 - Cooperative Search
 - DTED II (30m) Topographic Database
 - Platoon Convoying



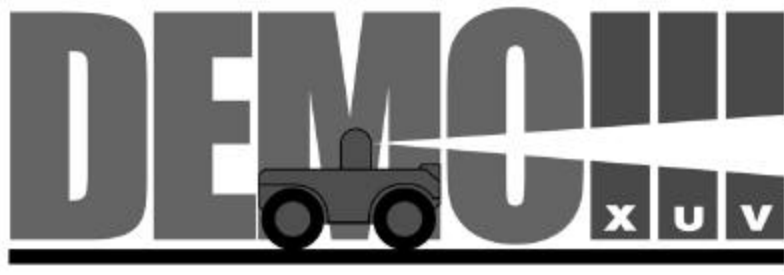
- **Communication**
 - RF Range: 10-15km using Available Military Frequencies
 - Data Rate: 25kbs/Vehicle
- **Control**
 - Multi-Threaded Control
 - Highly Modular, 4D-RCS - JAUGS
 - Tactical Behaviors
 - Safely Operable in Mixed Force (Mounted/Unmounted, Manned/Unmanned)



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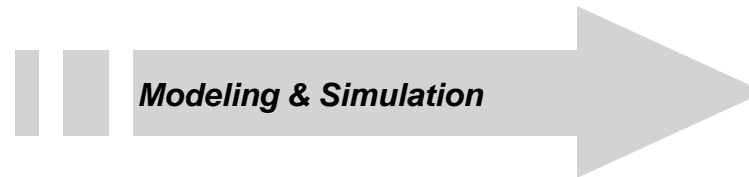
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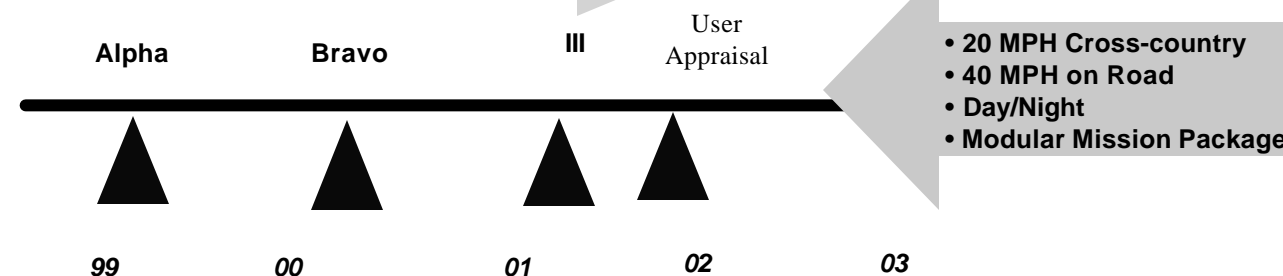
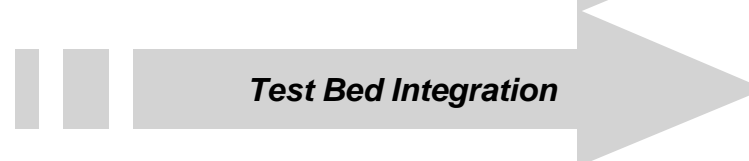


Game Plan

Pacing Technologies



- Perception
- Software Architecture
- Man/Machine Interface





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Demo III Experimental Unmanned Vehicle (XUV) DEMO A Configuration





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XUV DEMO B Configuration





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XUV DEMO III Final Configuration



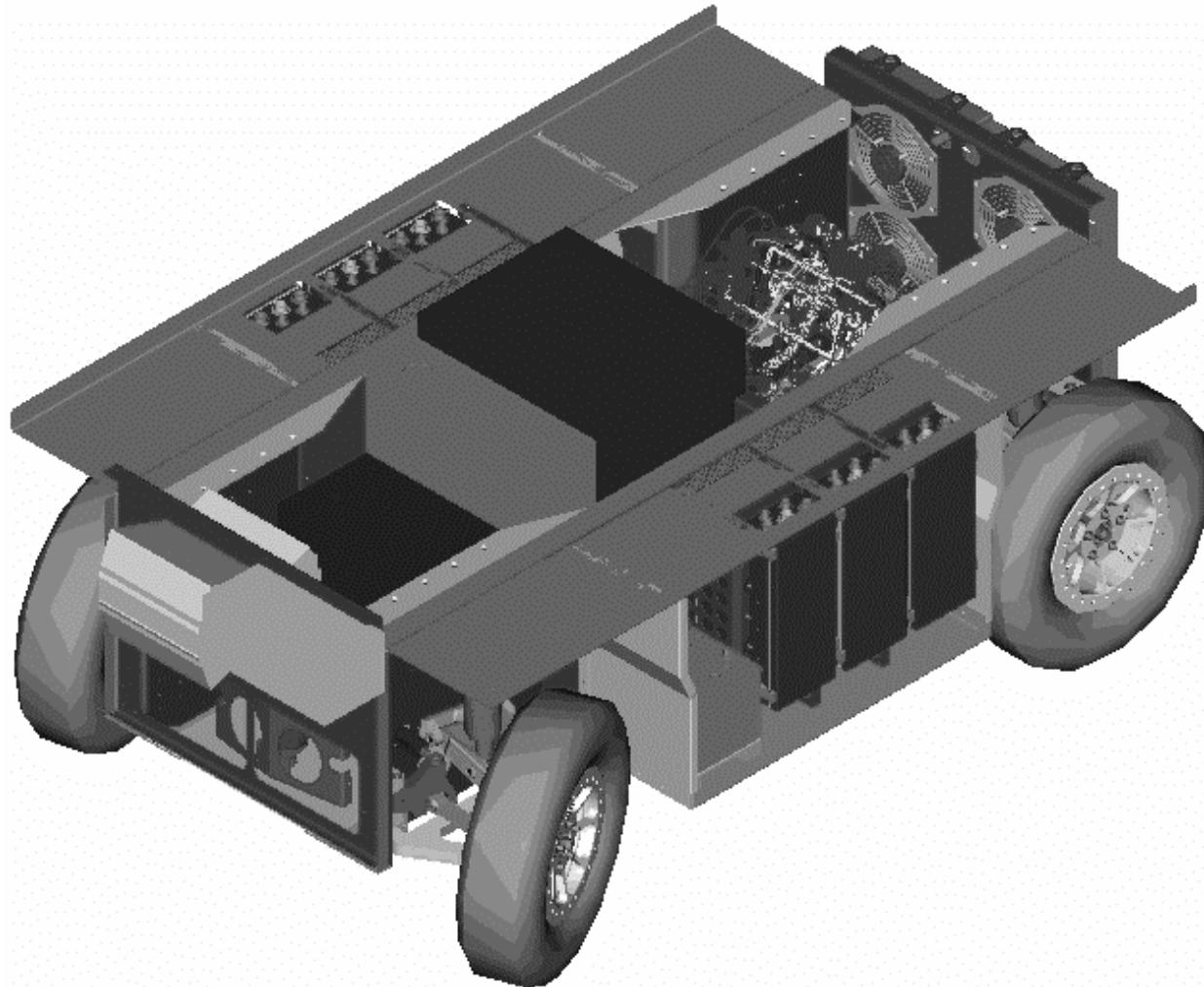


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Platform





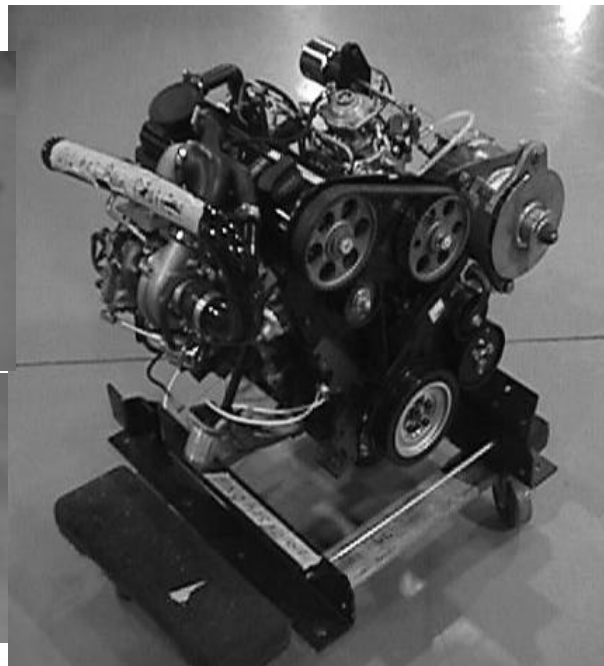
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Platform - Powertrain

- 78 Hp VW Turbo Diesel Engine
- 70 GPM Sunstrand Hydrostatic Pump
- Pump Drive Sized for 4300 RPM and 2500 RPM Engine Speeds
- 15 Cu In Eaton 2-Speed Wheel Motors
- John S. Barnes Mechanical Flow Divider

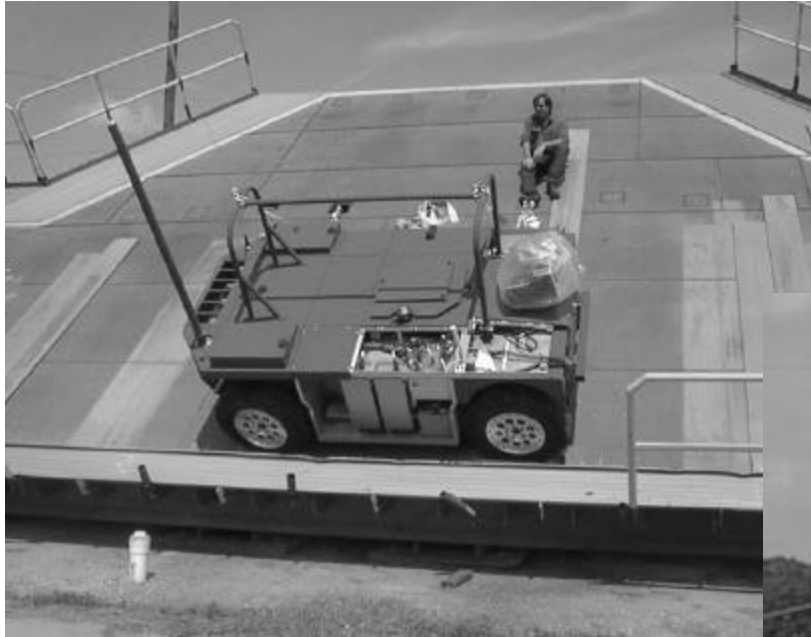




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XUV Sideslope Capability



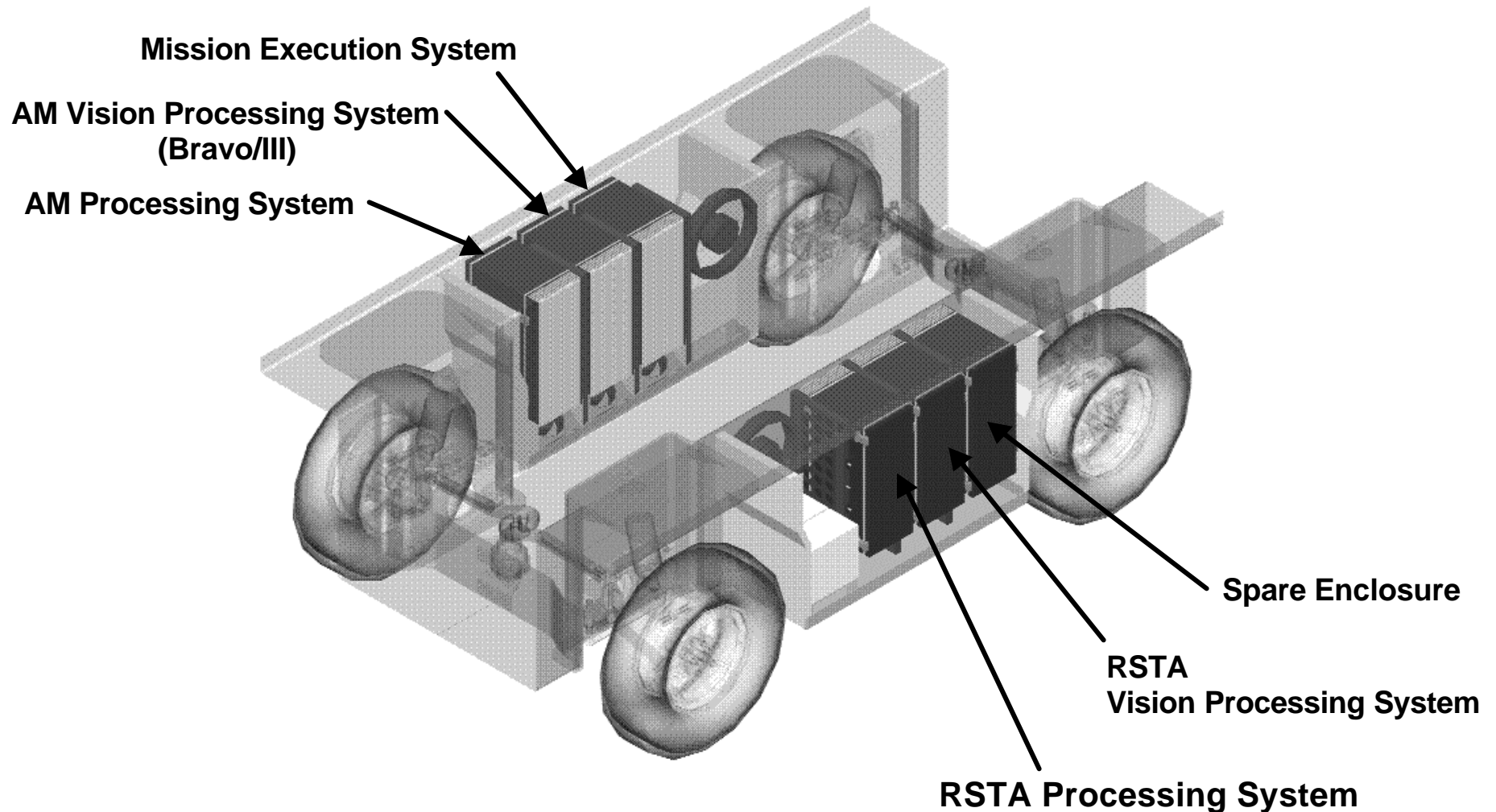


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Vetronics - Processing Enclosures



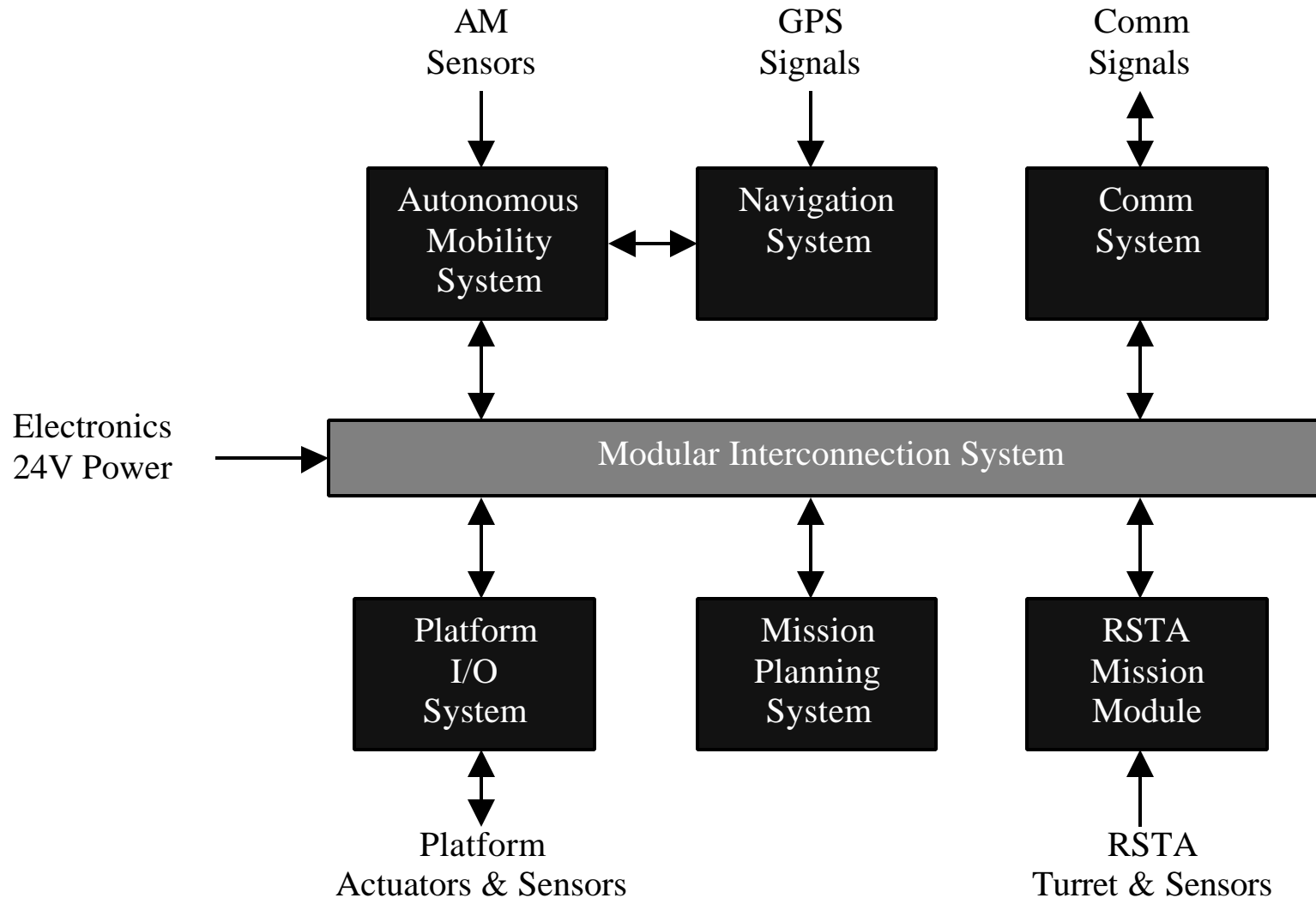


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Vetronics

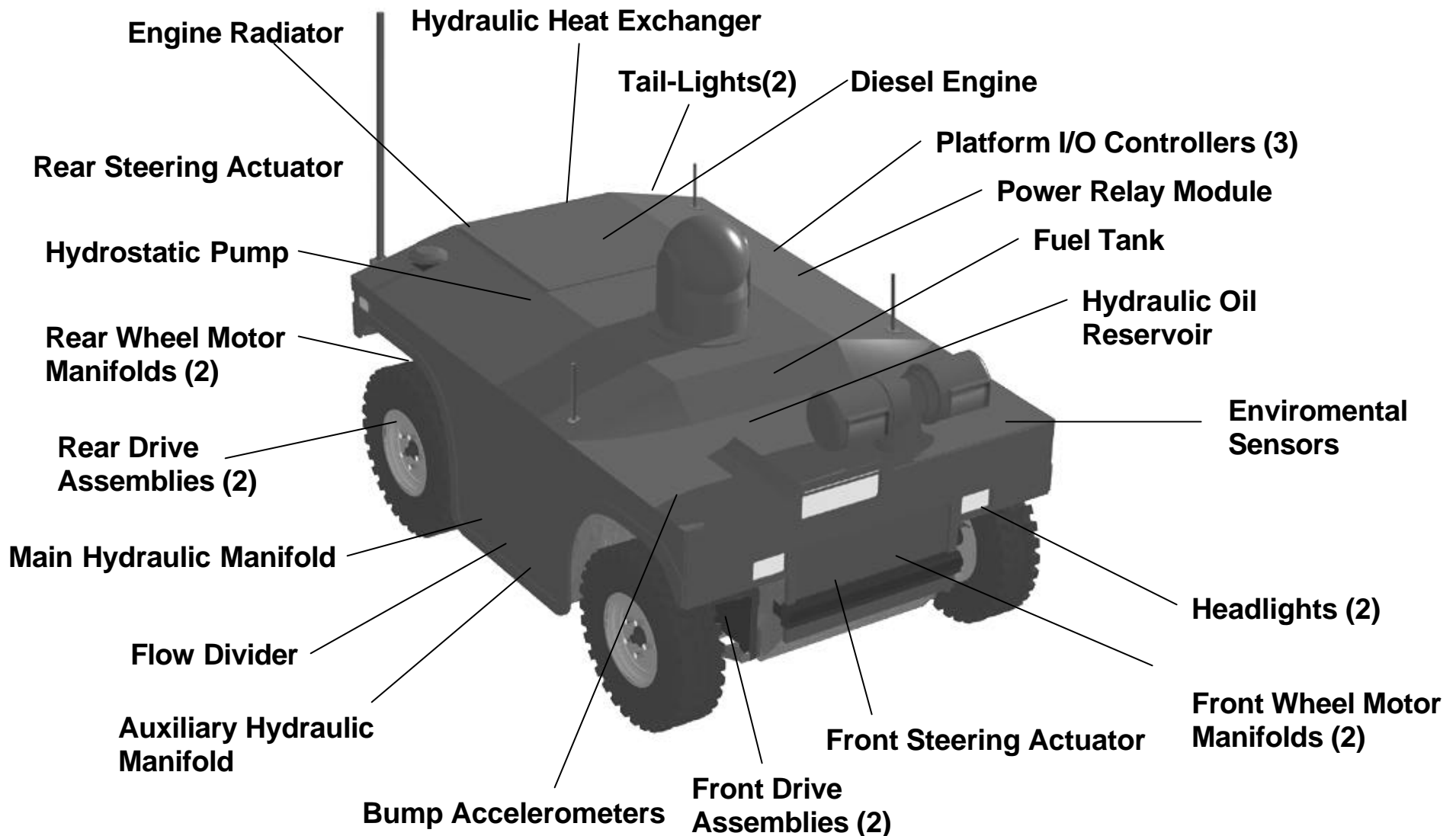




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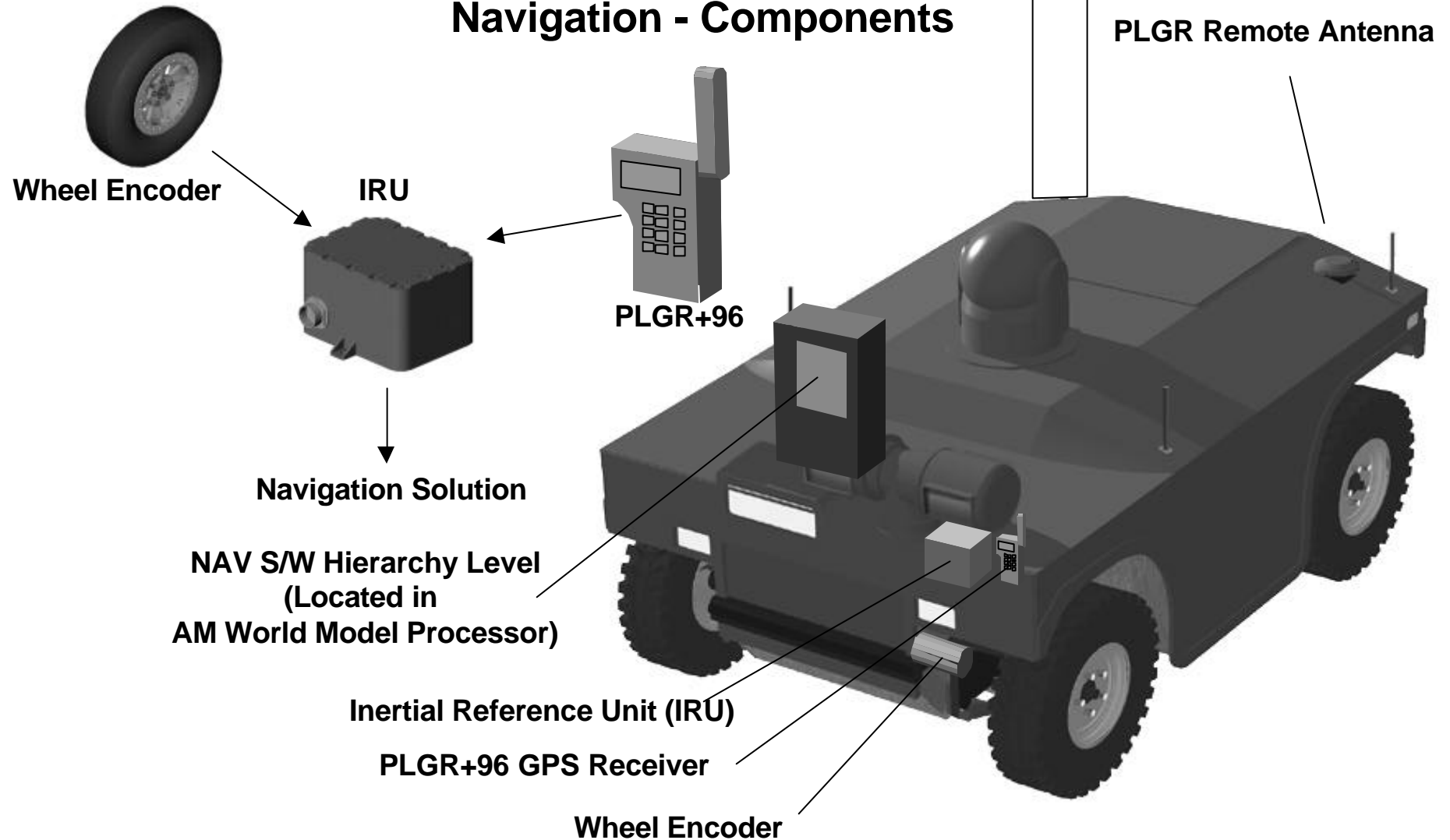


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Navigation - Components





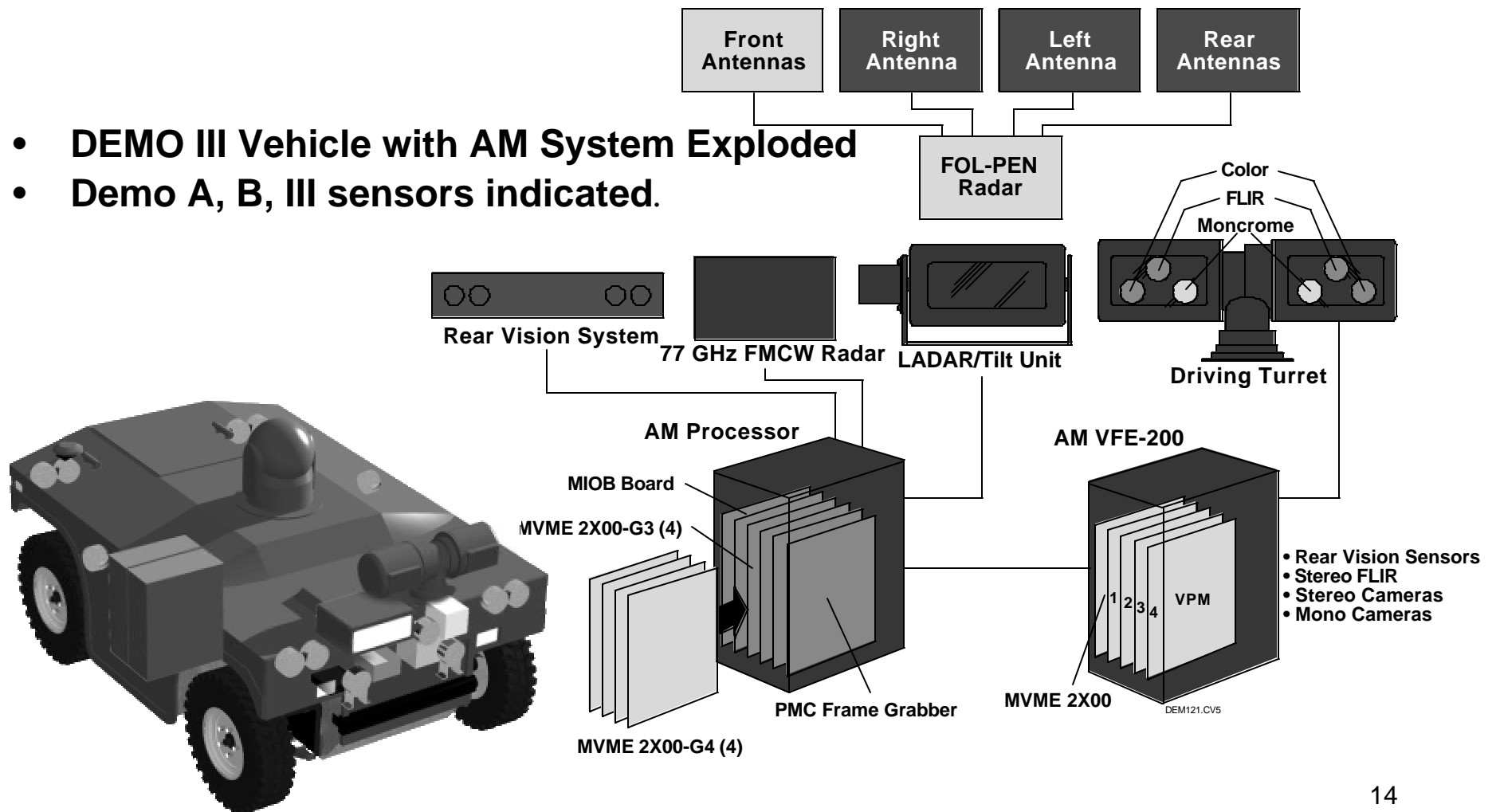
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Autonomous Mobility on the XUV

- DEMO III Vehicle with AM System Exploded
- Demo A, B, III sensors indicated.



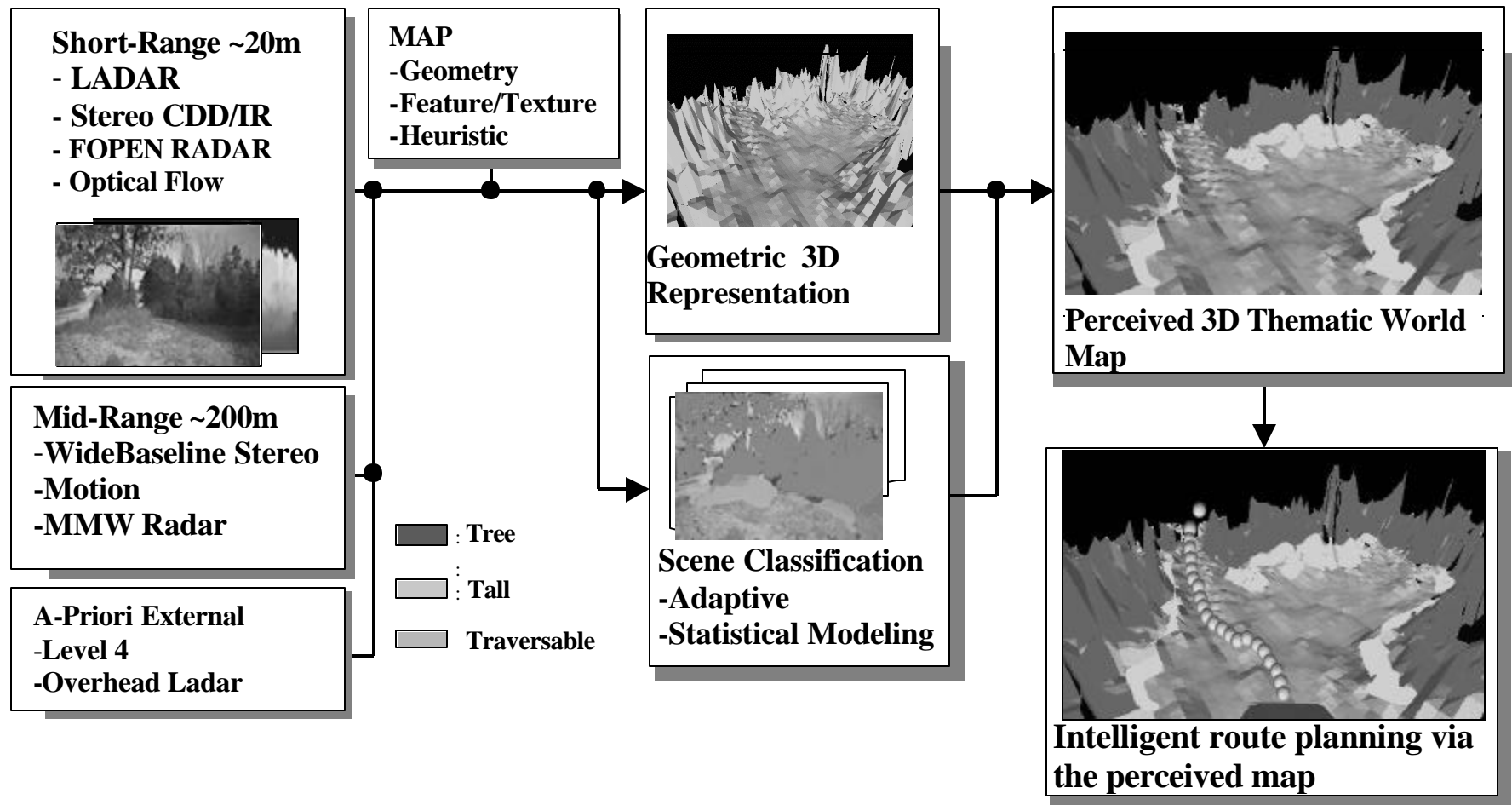


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Autonomous Mobility on the XUV





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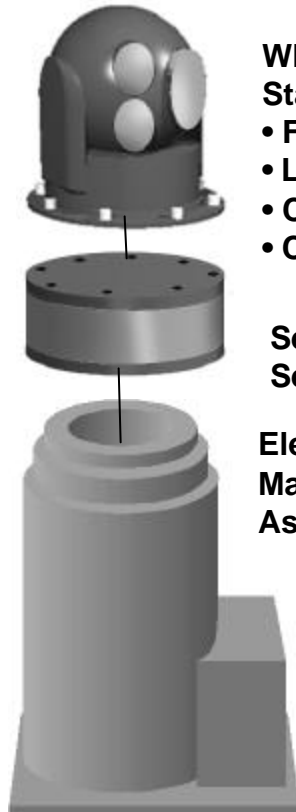
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RSTA on the XUV

RSTA Sensor Integration Plan.

AM Sensors	Alpha	Bravo	III
Wescam 14QS Gimbal	X	X	X
Acoustic Sensor Array	X	X	X
Acoustic Noise Cancellation		X	X
Additional Cueing Sensors		X	X
Self-Protection Sensors		X	X
Mast Assembly		X	X



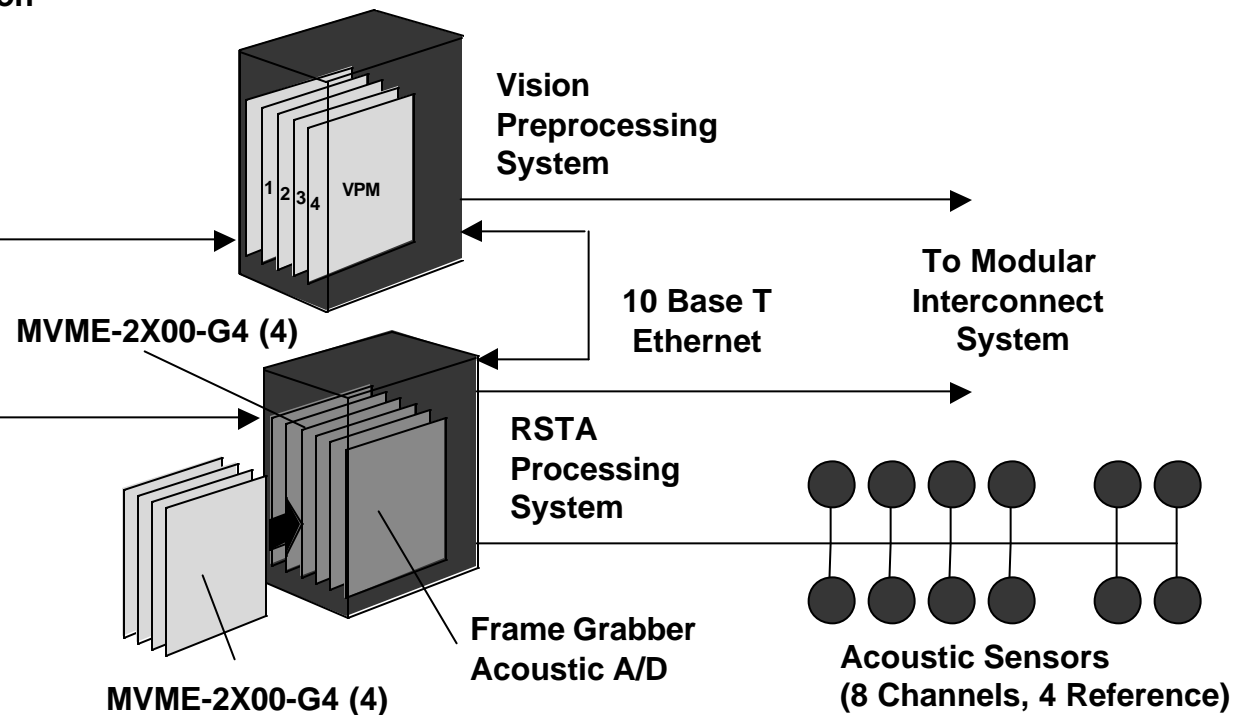
WESCAM Model 14QS

Stabilized Gimbal

- FLIR (Amber Galileo 3-5mm)
- Laser Ranger
- Color Camera
- Color Spotter Scope

**Self Protection
Sensors**

**Elevated
Mast
Assembly**





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RSTA Mission Module

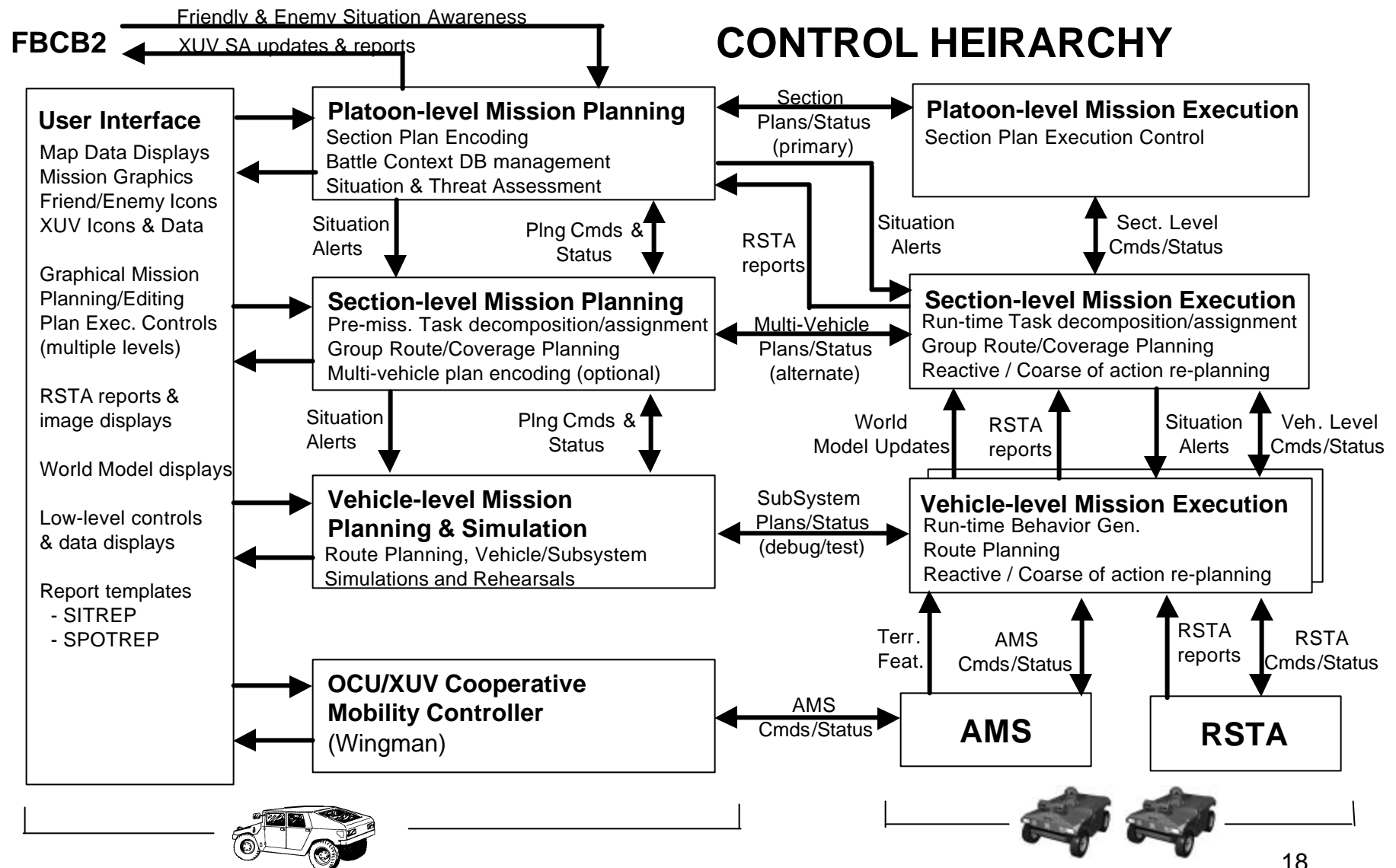




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Operator Control Unit - Hardware



16" diagonal LCD w/
NEMA 12 enclosure

Rugged Keyboard

Multi-position swing
arm for LCD

Electronics Box,
shock mounted

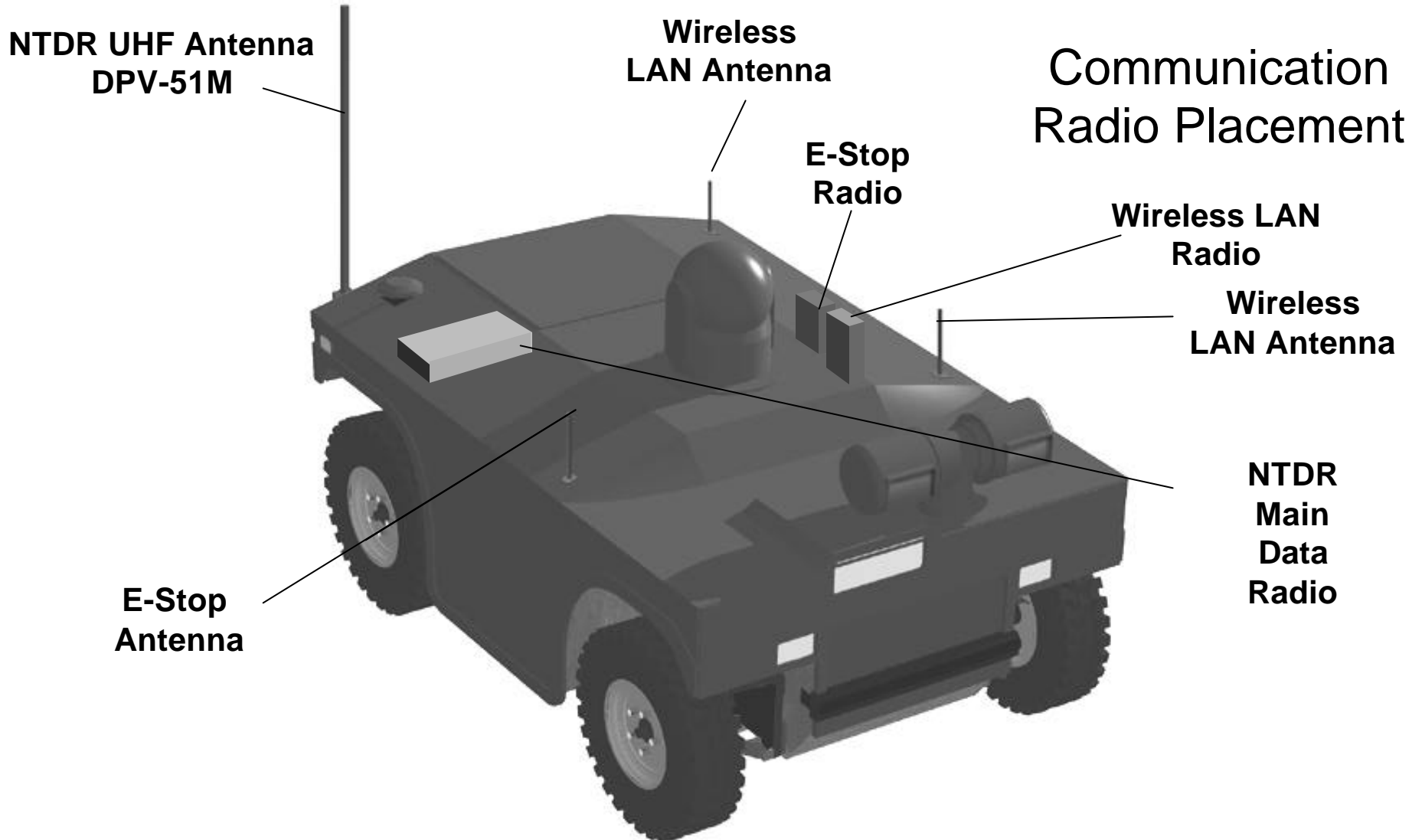




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JAVELIN FIRE AT REDSTONE BY UGV/S JPO

